maintained. Each entity has a unique handle. The identity of the presence server maintaining presence information for the entity can be determined from the handle. A handle is well known name for an entity. An example of a handle is pp://www.intercom.att.com/TyrantRana. Finally, a point of presence (PoP) is defined as a point of presence for an entity. If an entity is present, it is connected to one PoP. Each PoP has an address, e.g., an IP address and a port number, at which presence messages may be delivered.--

A2

Please replace the paragraph beginning at page 5, line 19, with the following rewritten paragraph:

--There are currently models, including the models described above, that provide for instant messaging (IM) and presence services within the scope of an Internet Protocol / data network environment. It will be appreciated from the discussion above that one of the key elements of IM operation involves the ability for one subscriber to "know" when another subscriber is logged in or is "available." From the discussion above, it will also be appreciated that the ability to track the login status, otherwise known as "presence," of Internet users is fairly well developed and widely practiced. However, as communication networking technology has continued to evolve at a rapid pace, so have the means by which end users or subscribers can communicate. More particularly, the explosive growth of hand-held, wireless communication terminals, such as cell phones, wireless Web phones, and personal digital assistants has led to a demand for inter-networking or inter-medium communication solutions. In other words, it is rapidly becoming useful for a subscriber ~~to~~ have his or her wireless phone status or "presence" known to other subscribers, where these other subscribers may be using a variety of communication mediums, such as wireless phone service, wired phone service, short message service (SMS), or Internet service.--

A3

Please replace the paragraph beginning at page 7, line 20, with the following rewritten paragraph:

--According to another aspect, a presence registration and routing node includes an advanced database communications module (ADCM) for receiving

A4

queries for presence information. The ADCM module forwards the queries to a presence application, such as a SIP, IMPP, or presence application. The presence application formulates a presence-server-compatible message, forwards the presence-server-compatible message to a presence database, receives a response from the database, and forwards the response to the ADCM module to be sent to the requestor over an IP network. The presence database may be internal or external to the presence registration and routing node.--

A4

Please replace the paragraph beginning at page 9, line 23, with the following rewritten paragraph:

--Figures 5(A) and 5(B) are a flow chart illustrating exemplary steps that may be performed by a presence registration and routing node in processing an IAM message according to an embodiment of the present invention;--

A5

Please replace the paragraph beginning at page 10, line 22, with the following rewritten paragraph:

--Figure 13 is a block diagram of a presence registration and routing node including an external presence database according to an embodiment of the present invention;--

A6

Please replace the paragraph beginning at page 13, line 16, with the following rewritten paragraph:

--Shown in Figure 3 is a schematic diagram of a presence registration and routing node **300** of the present invention. It will be appreciated that presence registration and routing node **300** includes a high speed Interprocessor Message Transport (IMT) communications bus **310**. Communicatively coupled to IMT bus **310** are a number of distributed processing modules or cards including a pair of Maintenance and Administration Subsystem Processors (MASPs) **312**, an SS7 capable Link Interface Module (LIM) **320**, an IP capable Advanced Database Communication Module (ADCM) **360**, and a Presence Registration Module (PRM) **340**. These modules are physically connected to the IMT bus **310** such that signaling and other type messages may be routed internally between all active cards or modules. For simplicity of illustration, only a single LIM **320**, ADCM **360**, and PRM

A7

A7

340 are included in Figure 3. However, it should be appreciated that the distributed, multi-processor architecture of the presence registration and routing node 300 facilitates the deployment of multiple LIM, ADCM, PRM, and other cards, all of which could be simultaneously connected to the IMT bus 310.–

Please replace the paragraph beginning at page 14, line ~~16~~ 14, with the following rewritten paragraph:

A8

–Focusing now on LIM card functionality, it will be appreciated that LIM **320** is comprised of a number of sub-component processes including, but not limited to, an SS7 MTP level 1 process **322**, an SS7 MTP level 2 process **324**, an I/O buffer or queue **325**, a gateway screening (GWS) process **326**, a Presence Registration Request (PRR) stop action process **328**, an SS7 MTP level 3 layer HMDC process **330**, and an HMDT process **332**. MTP level 1 and 2 processes **322** and **324**, respectively, provide the facilities necessary to send and receive digital data over a particular physical media / physical interface, as well as to provide error detection / correction and sequenced delivery of all SS7 message packets. I/O queue **325** provides for temporary buffering of incoming and outgoing signaling message packets. GWS process **326** is responsible for examining the incoming signaling message and determining which, if any, of the provisioned stop actions are applicable. PRR stop action process **328** is responsible for making a copy of and subsequently encapsulating an incoming SS7 ISDN User Part (ISUP) IAM signaling message packet within an SS7 Signaling Connection Control Part (SCCP) formatted packet. It should be appreciated that PRR stop action process **328** could also be configured to simply encapsulate the original incoming SS7 ISUP IAM signaling message, without making a copy. MTP level 3 HMDC process **330** receives signaling messages from the lower processing layers and performs a discrimination function, effectively determining whether an incoming SS7 message packet requires internal processing or is simply to be through switched. For instance, in the case of an SS7 TCAP message associated with presence registration or an SCCP encapsulated ISUP IAM message, HMDC process **330** would determine that the message should be internally routed for further processing. HMDT process **332**

manages or directs the internal routing of SS7 message packets that require additional processing prior to final routing. Once again, it should be appreciated that a LIM card may contain more functional processes than those described above. The above discussion is limited to LIM functionality associated with the basic processing of in-bound signaling messages.--

A8

Please replace the paragraph beginning at page 16, line 15, with the following rewritten paragraph:

--In general, a PRM card includes the database and database control processes necessary to achieve the presence registration message generation and routing functionality of the present invention. The PRM **340** shown in Figure 3 is comprised, in part, of an SCCP subsystem controller known as a Signaling Connection Routing Controller (SCRC) process **342**, a Presence Registration Manager (PRMG) process **344**, and a number of Presence Registration Applications generally indicated by reference numeral **346**. Included among the presence registration applications is a session initiation protocol (SIP) registration application process **348** for generating SIP messages, forwarding the SIP messages to a presence server, and processing SIP messages received from the presence server. The format for SIP messages is described in detail in the above-referenced RFC 2543, which defines the SIP protocol. In addition, the portion of a SIP message that carries the media capabilities information for an end user device is referred to as the session description protocol portion. The session description protocol is described in detail in RFC 2327, "SDP: Session Description Protocol," (April 1998), the disclosure of which is incorporated herein by reference in its entirety.--

A9

Please replace the paragraph beginning at page 18, line 1, with the following rewritten paragraph:

--SCRC process **342** is responsible for discrimination of signaling messages at the SCCP level, and for distributing the signaling messages to an appropriate higher processing level application or function. In the configuration shown in Figure 3, the next highest processing level is represented by PRMG process **344**. PRMG process **344** is responsible for determining how to process the incoming message packet.

A10

For instance, if the message packet contains an SCCP encapsulated ISUP IAM message, PRMG process **344** is configured to de-capsulate the original ISUP IAM message and subsequently extract the appropriate information necessary for further processing from the de-capsulated message. However, if the incoming message were a TCAP formatted packet, no de-capsulation action would be required. In either case, PRMG process **344** is also charged with determining which of the provisioned presence registration applications is required for successful processing of a particular incoming signaling message packet. As will be appreciated from Figure 3, a number of presence registration applications may be simultaneously provisioned on a single PRMG card. These presence registration applications may be configured such that each application is capable of generating presence registration messages that are formatted in different protocols including, but not limited to, SIP, IMPP, and presence protocol.--

A10

Please replace the paragraph beginning at page 19, line 17, with the following rewritten paragraph:

--Referring to Figure 5(A), in step **ST1**, an incoming ISUP IAM message is received at inbound LIM module **320**. In steps **ST2** and **ST3**, the incoming ISUP IAM message is received and processed by the MTP Level 1 and 2 processes **322** and **324**, respectively. With MTP Level 1 and 2 processing complete, the signaling message packet is temporarily buffered in the I/O queue **325** before being passed up the stack to the MTP Level 3 Gateway Screening (GWS) process **326**. As indicated in step **ST4**, GWS process **326** examines the incoming ISUP IAM message and determines not only whether the message is to be allowed into the switch for further processing, but also which, if any, of the provisioned stop actions are applicable to the incoming message. In this example, GWS process **326** examines the incoming ISUP IAM message and determines that the message is permitted to enter the switch. Furthermore, upon examination of the Originating Point Code (OPC), Destination Point Code (DPC) and Service Indicator Octet (SIO) fields contained in the MTP routing layer, it is determined that the message requires additional processing by the PRR stop action **328** (**ST5**). In step **ST6** PRR stop action process

A11

328 receives the ISUP IAM message from GWS process **326** and determines that the incoming message is an ISUP type MSU. The PRR stop action process **328** next checks the DPC of the incoming MSU. More specifically, the PRR stop action verifies that the DPC of the incoming MSU is a valid PC. PRR stop action **328** examines the incoming MSU to determine whether presence registration service is required. If the incoming MSU is identified as being an ISUP IAM type message, PRR stop action **328** encapsulates a copy of the ISUP IAM message within an SCCP formatted MSU, as indicated in step **ST6**. Such SCCP encapsulation is effectively achieved by adding essential SCCP message leading and trailing bit sequences to the base bit sequence that comprises the ISUP IAM MSU, as generally illustrated in Figure 6. Thus, an SCCP type encapsulated MSU is created which envelops or contains an ISUP type MSU. Subsequent to this encapsulation, the incoming message no longer appears or is treated as an ISUP IAM message within the presence registration and routing node **300**, but is instead processed internally as an SCCP type SS7 message.--

A11

Please replace the paragraph beginning at page 21, line 8, with the following rewritten paragraph:

--However, in the case where an incoming ISUP MSU satisfies the **ST5** criteria, SCCP encapsulation of the ISUP MSU occurs and the resulting encapsulated MSU is directed to HMDC process **330** (**ST7**), where SCCP type processing is performed. In the example shown in Figure 3, HMDC process **330** examines the message packet and determines that the DPC and Subsystem Number (SSN) of the SCCP packet is the point code of the presence registration and routing node. Consequently, further processing of the SCCP MSU within the routing node is assumed to be necessary, and the packet is passed to HMDT process **332**. HMDT process **332** examines the Service Indicator (SI) field of the encapsulated MSU, which indicates that the encapsulating packet is of an SCCP type. As such, HMDT process **332** places the encapsulated SCCP MSU on high speed IMT bus **310** for transport to PRM **340** and subsequent presence registration service.--

A12

Please replace the paragraph beginning at page 21, line 21, with the following rewritten paragraph:

--Referring to Figure 5(B), in step **ST8**, the encapsulated SCCP MSU is received and examined by SCRC process **342** that is resident on PRM **340**. SCRC process **342** examines the message, determines that presence registration service is indicated, and forwards the encapsulated MSU to the PRMG process **344**, as indicated by step **ST9**. In step **ST10**, PRMG process **344** extracts the ISUP IAM MSU from the SCCP envelope and determines that the ISUP MSU requires the generation of a SIP-formatted presence registration message (**ST11**). The ISUP IAM MSU is subsequently directed to SIP application **348** for further processing (**ST12**). SIP application **348** examines the ISUP IAM MSU and, using information contained within the MSU, generates a SIP-formatted presence registration message (**ST13**).--

A12

Please replace the paragraph beginning at page 22, line 7, with the following rewritten paragraph:

--With SIP processing complete, the SIP-formatted presence registration message is passed to HMRT process **350.** HMRT process **350** determines to which ADCM card the SIP registration message packet should be routed for subsequent outbound transmission (**ST14**). In this case, the HMRT process **350** determines that the desired outbound signaling link associated with the routing of the SIP registration message is located on ADCM **360**. Consequently, the SIP message packet is internally routed across the IMT bus **310** to LIM **360**, where it is received by I/O queue **362** (**ST15**). Eventually, the modified message packet is passed from I/O queue **362** to the IP Level 2 and Level 1 processes **364** and **366**, respectively (**ST16**). Once again, IP level 1 and 2 processes **366** and **364**, respectively, provide the facilities necessary to send and receive digital data over a particular physical media / physical interface, as well as to provide error detection / correction and sequenced delivery of all IP message packets transmitted into the IP network. As indicated in step **ST17**, the SIP-formatted presence registration message is then transmitted into an IP network for ultimate delivery to and use by a presence database system.--

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Please replace the paragraph beginning at page 22, line 24, with the following rewritten paragraph:

A12

--It will be appreciated that the registration message generation methodology shown in Figure 4 is fundamentally similar to the process indicated in Figures 5(A) and 5(B). The primary difference involves processing variations that result from the handling of SS7 ISUP versus SS7 TCAP type messages. Most notably, since a TCAP message is, in fact, also an SCCP message, there is no need to directly encapsulate or copy and encapsulate the incoming TCAP message. Instead the TCAP message is simply directed from the inbound LIM **320** to the associated PRM **340** via the high speed IMT Bus **310**, in much the same manner as the SCCP encapsulated ISUP IAM described in detail above. As such, Figure 7 presents a flow chart of the major steps associated with the processing of a TCAP-type presence registration request message, which may be used in conjunction with the schematic diagram shown in Figure 4 to better understand the TCAP based presence registration message generation methodology.--

Please replace the paragraph beginning at page 24, line 16, with the following rewritten paragraph:

A13

--In step **ST6**, the TCAP MSU is received and examined by SCRC process **342** that is resident on PRM **340**. SCRC process **342** examines the message, determines that presence registration service is indicated, and forwards the TCAP MSU to the PRMG process **344**. As indicated in step **ST7**, the content of the TCAP message is examined to determine whether the TCAP presence registration request requires the generation of a SIP-formatted message. In this example, it is assumed that the TCAP registration request message requires a SIP-formatted response and, as such, is subsequently directed to SIP application **348** for further processing. SIP application **348** examines the TCAP MSU and, using information contained within the MSU, generates a SIP-formatted presence registration message (**ST8**).--

Please replace the paragraph beginning at page 25, line 3, with the following rewritten paragraph:

--With SIP processing complete, the SIP-formatted presence registration message is passed to HMRT process **350.** HMRT process **350** determines to which ADCM card the SIP registration message packet should be routed for subsequent outbound transmission (**ST9**). In this case, the HMRT process **350** determines that the desired outbound signaling link associated with the routing of the SIP registration message is located on ADCM **360**. Consequently, the SIP message packet is internally routed across the IMT bus **310** to LIM **360**, where it is received by I/O queue **362** (**ST10**). Eventually, the modified message packet is passed from I/O queue **362** on to the IP Level 2 and Level 1 processes **364** and **366**, respectively (**ST11**). As indicated in step **ST12**, the SIP-formatted presence registration message is then transmitted into an IP network for ultimate delivery to and use by a presence database system.--

A13

Please replace the paragraph beginning at page 25, line 16, with the following rewritten paragraph:

--Shown in Figures 8, 9 and 10 are simplified network diagrams that illustrate example implementations of the embodiments described above. More particularly, Figure 8 illustrates an implementation of the presence registration and routing node **300** of the present invention in a mobile or wireless telecommunications environment, generally indicated by the numeral **400**. Network **400** includes a mobile subscriber **402**, a base station complex **404**, a mobile switching center (MSC) **406**, a home location register (HLR) **408**, and a presence server **410**. It will be appreciated that the message flows shown in Figure 8 indicate that the presence registration and routing node **300** formulates and transmits a presence registration message **416** in response to the receipt of a location update message **412** that is sent from the MSC **406**. Those skilled in the art of wireless telecommunications will appreciate that an MSC performs a number of functions in a wireless network, including the formulation and routing of signaling messages. In the example shown in Figure 8, the location update signaling message used by the presence registration and routing node **300** to trigger the presence registration message **416** is destined for HLR node **408**. In such a wireless scenario, the presence registration message **416** could be formulated and

transmitted by the presence registration and routing node in response to a mobile location update message associated with the registration of a wireless customer in a particular cell or service area. Once again, those skilled in the art of wireless or mobile telecommunications will appreciate that wireless or mobile signaling messages are generated and transmitted within a wireless network in response to the powering-up or turning-on of a customer's wireless phone, as well as in response to inter-cell movement of a mobile subscriber during the course of a mobile call. As such, the presence registration and routing node of the present invention facilitates a method of presence registration that is completely transparent to the cell or mobile phone user.--

A13

Please replace the paragraph beginning at page 26, line 19, with the following rewritten paragraph:

--Figure 9 illustrates an implementation of presence registration and routing node **300** of the present invention in a wired telecommunications environment, generally indicated by reference numeral **420**. Network **420** includes a wireline subscriber **422**, an end office (EO) **424**, and a presence server **426**. It will be appreciated that the message flows shown in Figure 9 indicate that presence registration and routing node **300** formulates and transmits a presence registration message **434** in response to the receipt of an ISUP call signaling message from EO **424**. More particularly, presence registration message **434** is generated in response to the receipt of an ISUP Initial Address Message (IAM) message **428**. Those skilled in the art SS7 signaling will appreciate that an ISUP IAM message is the first in a sequence of ISUP formatted SS7 call control signaling messages that are required to complete a phone call in the Public Switched Telephone Network (PSTN). As such, it will be appreciated that in the scenario illustrated in Figure 9, presence registration message **434** is formulated in response to an attempt by wireline subscriber **422** to place a telephone call. As presence registration message generation is triggered by an ISUP IAM message, it will be appreciated by those skilled in the art of SS7 telecommunications that completion of an attempted telephone call is not required in order for a presence registration message to be generated and transmitted to a

presence server. Thus, any call attempts by wireline subscriber **422** will effectively register the subscriber's presence with presence server **426** via presence registration and routing node **300** of the present invention. It will also be appreciated from Figure 9, that triggering ISUP IAM message **428** is subsequently routed to a destination address specified in the message.--

A13

Please replace the paragraph beginning at page 27, line 20, with the following rewritten paragraph:

--Shown in Figure 10 is a variation of the scenario that was illustrated in Figure 9 whereby an SS7 signaling message used to trigger the formulation and subsequent transmission of a presence registration message is comprised of a TCAP-type message instead of an ISUP-type message. Shown in Figure 10 is an implementation of presence registration and routing node **300** of the present invention in a wired telecommunications environment, generally indicated by reference numeral **440**. Network **440** includes a wireline subscriber **442**, an end office (EO) **444**, and a presence server **446**. In the particular embodiment shown in Figure 10, it is assumed that the wireline subscriber **442** indirectly initiates a TCAP message **448** by dialing "*88" or a similar code on a telephone keypad. Once again, those skilled in the art of SS7 telecommunication networks will appreciate that generation of such TCAP messages is accomplished by an End Office (EO) or Service Switching Point (SSP) in response to the "*88" keystrokes, as generally indicated in Figure 10. As such, by dialing "*88" wireline subscriber **442** is effectively manually registering his or her presence with the presence server via the generation of the TCAP message 448, which in turn causes the generation of a presence registration message **450** by presence registration and routing node **300** of the present invention.--

Please replace the paragraph beginning at page 28, line 16, with the following rewritten paragraph:

A14

--The embodiments of the present invention described in detail above can be easily extended to include a presence registration and routing node that is capable of maintaining a presence database system. One embodiment of such a presence

registration and routing node is illustrated in Figure 11, and generally indicated by reference numeral **500**. It will be appreciated that in the particular embodiment presently contemplated, presence registration messages are not formulated and routed from the node. Instead presence registration takes place at or within the node. That is, in the embodiment of the present invention shown in Figure 11 and described below, the functionality of a presence server is included within presence registration and routing node **500**.–

A14

Please replace the paragraph beginning at page 29, line 3, with the following rewritten paragraph:

–With particular regard to the embodiment illustrated in Figure 11 and in a manner similar to the embodiment described above, it will be appreciated that presence registration and routing node **500** includes a high speed Interprocessor Message Transport (IMT) communications bus **310.** Communicatively coupled to IMT bus **310** are a number of distributed processing modules or cards including a pair of Maintenance and Administration Subsystem Processors (MASPs) **312**, an SS7 capable Link Interface Module (LIM) **320**, an IP capable Advanced Database Communication Module (ADCM) **360**, and a Presence Database Module (PDM) **502**. These modules are physically connected to the IMT bus **310** such that signaling and other type messages may be routed internally between all active cards or modules. For simplicity of illustration, only a single LIM **320**, ADCM **360**, and PDM **502** are included in Figure 11. However, it should be appreciated that the distributed, multi-processor architecture of the presence registration and routing node **500** facilitates the deployment of multiple LIM, ADCM, PDM, and other cards, all of which could be simultaneously connected to the IMT bus **310**.–

Please replace the paragraph beginning at page 29, line 24, with the following rewritten paragraph:

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–Once again, it will be appreciated that LIM **320** is comprised of a number of sub-component processes including, but not limited to an SS7 MTP level 1 process **322**, an SS7 MTP level 2 process **324**, an I/O buffer or queue **325**, a gateway screening (GWS) process **326**, a Presence Server Request (PRR) stop action

process **328**, an SS7 MTP level 3 layer HMDC process **330**, and an HMDT process **332**. MTP level 1 and 2 processes **322** and **324**, respectively, provide the facilities necessary to send and receive digital data over a particular physical media / physical interface, as well as to provide error detection / correction and sequenced delivery of all SS7 message packets. I/O queue **325** provides for temporary buffering of incoming and outgoing signaling message packets. GWS process **326** is responsible for examining the incoming signaling message and determining which, if any, of the provisioned stop actions are applicable. PRR stop action process **328** is responsible for making a copy of, and subsequently encapsulating, an incoming SS7 ISDN User Part (ISUP) IAM signaling message packet within an SS7 Signaling Connection Control Part (SCCP) formatted packet. It should be appreciated that PRR stop action process **328** could also be configured to simply encapsulate the original incoming SS7 ISUP IAM signaling message, without making a copy. MTP level 3 HMDC process **330** receives signaling messages from the lower processing layers and performs a discrimination function, effectively determining whether an incoming SS7 message packet requires internal processing or is simply to be through switched. For instance, in the case of an SS7 TCAP message associated with presence registration or an SCCP encapsulated ISUP IAM message, HMDC process **330** would determine that the message should be internally routed for further processing. HMDT process **332** manages or directs the internal routing of SS7 message packets that require additional processing prior to final routing. Once again, it should be appreciated that a LIM card may contain more functional processes than those described above. The above discussion is limited to LIM functionality associated with the basic processing of in-bound signaling messages.--

A15

Please replace the paragraph beginning at page 31, line 15, with the following rewritten paragraph:

--The processes explicitly shown on out-bound ADCM **360** include an I/O queue **362** and IP level 1 and 2 processes **366** and **364**, respectively. I/O queue **362** facilitates temporary buffering of incoming and outgoing signaling message packets,

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while IP addressing operations are performed by IP level 1 and 2 processes **366** and **364**, respectively.--

Please replace the paragraph beginning at page 32, line 1, with the following rewritten paragraph:

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--In general, a PDM card includes the database and database control processes necessary to facilitate the presence registration and query handling functionality of the contemplated embodiment of the present invention. PDM **502** shown in Figure 11 is comprised, in part, of an SCCP subsystem controller known as a Signaling Connection Routing Controller (SCRC) process **504**, a Presence Database Manager (PDMG) process **510**, and a number of Presence Database Interface (PDI) Applications generally indicated by the numeral **512**. Included among PDI Applications **512** are session initiation protocol (SIP) application process **518**, IMPP application process **514**, and presence protocol process **519**. SCRC process **504** is responsible for discrimination of signaling messages and subsequent distribution of these signaling messages to an appropriate higher processing level application or function. In the configuration shown in Figure 11, the next highest processing level is represented by PDMG process **510**. PDMG process **510** is generally responsible for determining which of the provisioned protocol-specific PDI Applications **512** is required process the incoming message packet. For instance, if the incoming presence registration packet contained a TCAP or SCCP-encapsulated IMPP message, PDMG process **510** would determine that provisioned PDI application **514** was required for successful processing. As will be appreciated from Figure 11, a number of PDI applications **512** may be simultaneously provisioned on a single PDMG card. These protocol-specific PDI applications may be configured such that each application is capable of receiving presence registration or query messages that are formatted in different protocols including, but not limited to, SIP, IMPP, and the presence protocol. Furthermore, these PDI applications **512** are also capable of generating or formatting protocol-specific presence service related response messages. Such a presence service response message might include, but is not limited to, a message that provides presence status information for a specific user in

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response to a presence status query. This particular scenario is specifically illustrated in Figure 11, where the presence status query packet assumes the form of an SS7 TCAP-encapsulated IMPP query message and the subsequent presence status response is contained within a SIP formatted message.--

Please replace the paragraph beginning at page 33, line 9, with the following rewritten paragraph:

--Once again, while any number or variety of PDI applications may be provisioned on a single PDM card, only IMPP, SIP, and presence protocol PDI applications **514**, **518**, and **519**, respectively, are described herein. SIP PDI application **518** contains the logic necessary to process incoming SIP presence messages and construct outgoing SIP presence response messages. Similarly, IMPP PDI application **514** contains the logic necessary to process incoming IMPP formatted presence messages and construct outgoing IMPP formatted presence response messages. Presence PDI application **519** contains the logic necessary to process incoming presence query messages formatted according to the presence protocol and construct outgoing presence response messages formatted according to the presence protocol.--

Please replace the paragraph beginning at page 34, line 4, with the following rewritten paragraph:

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--With particular regard to the scenario generally illustrated in Figure 11, it is assumed that an incoming TCAP-encapsulated IMPP formatted presence query message is received at the inbound LIM module **320** (**ST1**). Once again, in steps **ST2** and **ST3**, the incoming TCAP-encapsulated IMPP formatted presence query message is received and processed by the MTP Level 1 and 2 processes **322** and **324**, respectively. With MTP Level 1 and 2 processing complete, the signaling message packet is temporarily buffered in the I/O queue **325** before being passed up the stack to the MTP Level 3 Gateway Screening (GWS) process **326**. As indicated in step **ST4**, GWS process **326** examines the incoming TCAP presence query message and determines not only whether the message is to be allowed into the switch for further processing, but also which, if any, of the provisioned stop actions

are applicable to the incoming message. In the scenario shown in Figure 11, GWS process **326** examines the incoming TCAP-encapsulated IMPP presence query message and determines that the message is permitted to enter the switch. Furthermore, upon examination of the Originating Point Code (OPC), Destination Point Code (DPC) and Service Indicator Octet (SIO) fields contained in the MTP routing layer, it is determined that the message does not require additional processing by PRR stop action **328**. As such, the TCAP MSU is then routed directly to HMDC process **330** where SCCP type processing is performed (**ST5**). In the example shown in Figure 11, HMDC process **330** examines the message packet and determines that the DPC and Subsystem Number (SSN) of the TCAP packet is the PC and SSN of the internal presence server database system that is located on PDM card **502**. Consequently, further processing of the TCAP MSU within the routing node is assumed to be necessary, and the packet is passed to the HMDT process **332**. HMDT process **332** examines the Service Indicator (SI) field of the TCAP MSU, which indicates that the packet is of an SCCP type. As such, HMDT process **332** places the TCAP MSU on high speed IMT bus **310** for transport to PDM **502** and subsequent presence database service.--

A18

Please replace the paragraph beginning at page 35, line 9, with the following rewritten paragraph:

--In step **ST6**, the TCAP MSU is received and examined by SCRC process **504** that is resident on PDM **502**. SCRC process **504** examines the message, determines that presence database service is indicated, and forwards the TCAP MSU to PDMG process **510**. As indicated in step **ST7**, the message packet is examined to determine the protocol of the presence related message. In this case, the protocol of the presence related message encapsulated within the TCAP packet is IMPP. Next, in step **ST8**, the variety or type of presence service associated with the message is evaluated. Such general presence message types or varieties might include, but are not limited to, query and registration type messages.--

Please replace the paragraph beginning at page 37, line 8, with the following rewritten paragraph:

--With particular regard to the embodiment illustrated in Figure 13 and in a manner similar to the embodiment described above, it will be appreciated that presence registration and routing node **600** includes a high speed Interprocessor Message Transport (IMT) communications bus **310**. Communicatively coupled to IMT bus **310** are a number of distributed processing modules or cards including: a pair of Maintenance and Administration Subsystem Processors (MASPs) **312**, an SS7 capable Link Interface Module (LIM) **320**, an IP capable Advanced Database Communication Module (ADCM) **360**, and an External Presence Database Module (EPDM) **700**. As further indicated in Figure 13, EPDM **700** is connected to an external Presence Database Server platform **800** via a high-speed Ethernet-type connection **802**. In this embodiment, external Presence Database Server platform **800** includes the actual Presence Database entity **516**. With exception of EPDM card **700** and external Presence Database Server **800**, all other functional and operational aspects of the embodiment shown in Figure 13 are identical to that of the embodiment shown in Figure 11 and described above.--

A19

Please replace the paragraph beginning at page 38, line 1, with the following rewritten paragraph:

--In general, an EPDM card **700** includes the database and database control processes necessary to facilitate the presence registration and query handling functionality of the contemplated embodiment of the present invention. EPDM **700** shown in Figure 13 is comprised, in part, of an SCCP subsystem controller known as a Signaling Connection Routing Controller (SCRC) process **504**, a Presence Database Manager (PDMG) process **510**, and a number of Presence Database Interface (PDI) applications generally indicated by the numeral **512**. Included among PDI applications **512** are a session initiation protocol (SIP) application process **518**, an IMPP application process **514**, and a presence protocol process **519**. SCRC process **504** is responsible for discrimination of signaling messages and subsequent distribution of these signaling messages to an appropriate higher processing level application or function. In the configuration shown in Figure 13, the next highest processing level is represented by PDMG process **510**. PDMG process **510** is

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generally responsible for determining which of the provisioned protocol-specific PDI applications **512** is required process the incoming message packet. PDI applications **512** are capable of generating or formatting protocol-specific presence service related response messages. Such a presence service response message might include, but is not limited to, a message that provides presence status information for a specific user in response to a presence status query.--

Please replace the paragraph beginning at page 39, line 10, with the following rewritten paragraph:

A20

--Shown in Figure 14 is another embodiment of a presence registration and routing node of the present invention, generally indicated by reference numeral **900**. With particular regard to the embodiment illustrated in Figure 14 and in a manner similar to the embodiment described above, it will be appreciated that presence registration and routing node **900** includes a high speed Interprocessor Message Transport (IMT) communications bus **310**. As in the previously described embodiments, communicatively coupled to IMT bus **310** are a number of distributed processing modules or cards including a pair of Maintenance and Administration Subsystem Processors (MASPs), an SS7 capable Link Interface Module (LIM) **320**, and an IP capable Advanced Database Communication Module (ADCM) **360**, and a Presence Registration Module (PRM) **340**. Further included in presence registration and routing node **900** is an accounting and billing subsystem which is comprised of an accounting subsystem interface module (ASIM), generally indicated by reference numeral **910** and an accounting server platform (ASP), generally indicated by reference numeral **920**. It will be appreciated that the combination of ASIM card **910** and ASP accounting server **920** includes the database and control processes necessary to achieve the accounting and billing functionality of the present invention. From a practical implementation standpoint, ASP **920** could assume the form of a Sun Workstation or similar type computing platform. It will be further appreciated that an entire message accounting subsystem could also be integrated within a presence routing and registration node.--

Please replace the paragraph beginning at page 40, line 7, with the following rewritten paragraph:

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--ASIM card **910** shown in Figure 14 includes a Signaling Connection Control Part (SCCP) subsystem **912** that is responsible for receiving and preliminary processing of incoming SCCP encapsulated accounting message packets. ASIM card **910** also includes an SCCP controller known as a Signaling Connection Routing Controller (SCRC) process **914** and a high-speed Ethernet Controller (EC) process **916**. Once again, as described above, SCCP subsystem **912** is responsible for receiving and preliminary processing of incoming SCCP encapsulated message packets, while SCRC process **914** is responsible for discrimination and subsequent distribution of messages based on information contained in an SCCP packet. In the case of ASIM card **910**, messages that satisfy the SCRC discrimination criteria are distributed or directed to high-speed Ethernet Controller process **916**. EC process **916** is in turn responsible for controlling the process of communicating messages, via an Ethernet connection to and from associated ASP server **920**. More particularly, ASP server **920** includes a corresponding high-speed Ethernet Controller process **922** that serves as the communications interface between ASIM card **910** and an on-board accounting server manager (ASM) process **924**. ASM process **924** is responsible for the de-capsulation or removal of the SCCP envelope that contains the accounting message. The de-capsulated accounting message is then passed to an adjacent usage and measurements process **926** where usage measurement statistics are created and stored in a usage measurements database (UMD) process **930**, such as that shown in Figure 15.--

Please replace the paragraph beginning at page 41, line 6, with the following rewritten paragraph:

--Usage measurements statistics produced by such a process could include, but are not limited to, peg counts of messages received from a specific network address, a specific service provider, a specific service user, a specific IP socket, or a specific signaling link. Furthermore, information specific to the type of service requested, calling and called party information, and other information associated with

a communication that could be useful in generating a bill or invoice may also be stored in a UMD. As shown in sample UMD process **930**, in one simplified embodiment, each communication is identified by a transaction ID, and certain predetermined information associated with a communication can be stored in the database. It will be appreciated that the information contained in a UMD database could be significantly more or less detailed than that indicated in the example shown in Figure 15.--

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Please replace the paragraph beginning at page 43, line 20, with the following rewritten paragraph:

--Figure 16 illustrates yet another embodiment of a presence registration and routing node of the present invention, which extends the integrated accounting and billing subsystem concept to the routing node previously presented in Figure 11. This new embodiment of a presence server and routing node is generally indicated by reference numeral **950**. With particular regard to the embodiment illustrated in Figure 16 and in a manner similar to those embodiments described above, it will be appreciated that presence registration and routing node **950** includes a high speed Interprocessor Message Transport (IMT) communications bus **310**. Communicatively coupled to IMT bus **310** are a number of distributed processing modules or cards including a pair of Maintenance and Administration Subsystem Processors (MASPs), an SS7 capable Link Interface Module (LIM) **320**, and an IP capable Advanced Database Communication Module (ADCM) **360**, and a Presence Registration Module (PRM) **340**. Further included in the presence registration and routing node **950** is an accounting and billing subsystem which is comprised of an accounting subsystem interface module (ASIM), generally indicated by reference numeral **910**, and an accounting server platform (ASP), generally indicated by reference numeral **920**. Again, it will be appreciated that the combination of ASIM card **910** and ASP accounting server **920** includes the database and control processes necessary to achieve the accounting and billing functionality of the present invention.--

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Please replace the paragraph beginning at page 44, line 16, with the following rewritten paragraph: